

Luca Schaffler, Curriculum Vitae

Department of Mathematics and Physics
Roma Tre University
Largo San Leonardo Murialdo 1
00146 Rome, Italy

Office: 310
Email: luca.schaffler@uniroma3.it
Web: <https://ricerca.matfis.uniroma3.it/users/lSchaffler/>

Research Interests

Algebraic geometry. Compactifications of moduli spaces, birational geometry, minimal model program, geometric invariant theory, Hodge theory. Algebraic surfaces, hyperplane arrangements, point arrangements. Combinatorial aspects related to algebraic geometry: toric varieties, convex geometry, matroids.

Positions Held

- Tenure-Track Assistant Professor (*Ricercatore a tempo determinato di tipo B*), Roma Tre University
Dates: March 1, 2022 – present
- Postdoc, KTH Royal Institute of Technology
Dates: August 17, 2020 – February 28, 2022
Research mentor: Prof. Sandra Di Rocco
- Marshall H. Stone Visiting Assistant Professor, University of Massachusetts Amherst
Dates: September 1, 2017 – August 31, 2020
Research mentor: Prof. Jenia Tevelev

Education

- Ph.D. Mathematics, University of Georgia, 2012 – 2017
Thesis title: The KSBA Compactification of a 4-dimensional Family of Polarized Enriques Surfaces
Advisor: Prof. Valery Alexeev
- M.S. Mathematics, Roma Tre University, 2010 – 2012
Thesis title: Distribution of Rational Points on Algebraic Curves
Advisor: Prof. Lucia Caporaso
Grade: 110/110 cum laude
- B.S. Mathematics, Roma Tre University, 2007 – 2010
Final test: comprehensive exam
Grade: 110/110 cum laude

Preprints

- Patricio Gallardo, Gregory Pearlstein, Luca Schaffler, and Zheng Zhang. *Unimodal singularities and boundary divisors in the KSBA moduli of a class of Horikawa surfaces*, (2022). arXiv:2209.08877.
- Sandra Di Rocco, Lukas Gustafsson, and Luca Schaffler. *Gaussian likelihood geometry of projective varieties*, (2022). arXiv:2208.12560.

Publications

- Riccardo Moschetti, Franco Rota, and Luca Schaffler. *A computational view on the non-degeneracy invariant for Enriques surfaces*. **Experimental Mathematics**. Published online: 29 August 2022.
<https://doi.org/10.1080/10586458.2022.2113576>
- Sandra Di Rocco and Luca Schaffler. *Families of pointed toric varieties and degenerations*. **Mathematische Zeitschrift** 301 (2022), no. 4, 4119–4139.
<https://doi.org/10.1007/s00209-022-03047-y>
- Luca Schaffler and Jenia Tevelev. *Compactifications of moduli of points and lines in the projective plane*. **International Mathematics Research Notices**. Published online: 06 August 2021.
<https://doi.org/10.1093/imrn/rnab200>
- Patricio Gallardo, Matt Kerr, and Luca Schaffler. *Geometric interpretation of toroidal compactifications of moduli of points in the line and cubic surfaces*. **Advances in Mathematics** 381, 16 April 2021.
<https://doi.org/10.1016/j.aim.2021.107632>
- Alessio Caminata, Noah Giansiracusa, Han-Bom Moon, and Luca Schaffler. *Point configurations, phylogenetic trees, and dissimilarity vectors*. **Proceedings of the National Academy of Sciences of the United States of America (PNAS)** March 23, 2021 118 (12).
<https://doi.org/10.1073/pnas.2021244118>
- Kuan-Wen Lai, Yu-Shen Lin, and Luca Schaffler. *Decomposition of Lagrangian classes on K_3 surfaces*. **Mathematical Research Letters** 28 (2021), no. 6, 1739–1763.
<https://dx.doi.org/10.4310/MRL.2021.v28.n6.a5>
- Alessio Caminata and Luca Schaffler. *A Pascal's theorem for rational normal curves*. **Bulletin of the London Mathematical Society** 53 (2021), no. 5, 1470–1485.
<https://doi.org/10.1112/blms.12511>
- Han-Bom Moon and Luca Schaffler. *KSBA compactification of the moduli space of K_3 surfaces with a purely non-symplectic automorphism of order four*. **Proceedings of the Edinburgh Mathematical Society** (2) 64 (2021), no. 1, 99–127.
<https://doi.org/10.1017/S001309152100002X>
- Alessio Caminata, Noah Giansiracusa, Han-Bom Moon, and Luca Schaffler. *Equations for point configurations to lie on a rational normal curve*. **Advances in Mathematics** 340 (2018), 653–683.
<https://doi.org/10.1016/j.aim.2018.10.013>
- Luca Schaffler. *K_3 surfaces with \mathbb{Z}_2^2 symplectic action*. **Rocky Mountain Journal of Mathematics** 48 (2018), no. 7, 2347–2383.
<https://doi.org/10.1216/RMJ-2018-48-7-2347>

- Luca Schaffler. *The KSBA compactification of the moduli space of $D_{1,6}$ -polarized Enriques surfaces*. **Mathematische Zeitschrift** 300 (2022), no. 2, 1819–1850.
<https://doi.org/10.1007/s00209-021-02842-3>
- Luca Schaffler. *On the cone of effective 2-cycles on $\overline{M}_{0,7}$* . **European Journal of Mathematics** 1 (2015), no. 4, 669–694.
<https://doi.org/10.1007/s40879-015-0072-2>

Teaching Experience

- Roma Tre University

Main Instructor

- Riemannian Geometry, GE430, master's degree course, Spring 2022

- KTH Royal Institute of Technology

Main Instructor

- Commutative Algebra and Algebraic Geometry, MM7042, master's degree course joint between KTH and Stockholm University, Fall 2021 (co-taught with Timothy Hosgood)
- Intersection Theory and Moduli Spaces, PhD reading course, Term 4, Spring 2021. Link to course webpage:
https://people.kth.se/~lucsch/intersection_theory_and_moduli_spaces_spring_2021.html

Teaching Assistant

- Discrete Mathematics, SF1610, Term 4, Spring 2021
- Calculus in One Variable, SF1685, Term 3, Spring 2021

- University of Massachusetts Amherst

Main Instructor

- Multivariate Calculus, MATH 233, one section, Spring 2020
- Fundamental Concepts of Mathematics, MATH 300, two sections, Fall 2019
- Fundamental Concepts of Mathematics, MATH 300, one section, Spring 2019
- Introduction to Abstract Algebra I, MATH 411, two sections, Fall 2018
- Fundamental Concepts of Mathematics, MATH 300, one section, Spring 2018
- Multivariate Calculus, MATH 233, two sections, Fall 2017

- University of Georgia

Main Instructor

- Calculus I for Science and Engineering, MATH 2250, one section, Spring 2015
- Precalculus, MATH 1113, one section, Fall 2014

Teaching Assistant

- Analytic Geometry and Calculus, MATH 2200, Fall 2013

Grader

- Real Analysis I, MATH 8100, Fall 2014

- Graph Theory, MATH 4690/6690, Spring 2014
- Modern Algebra and Geometry I, MATH 4000/6000, Fall 2013
- Point Set Topology, MATH 4200/6200, Spring 2013
- Algebraic Topology, MATH 8200, Spring 2013, Spring 2014
- Combinatorics, MATH 4670/6670, Fall 2012
- Real Analysis, MATH 4100/6100, Fall 2012

Tutor

- Precalculus and Calculus (Study Hall)

- Roma Tre University

Tutor

- Complex Analysis, AC310, Fall 2010
- Mathematical Physics, FM1, Spring 2010

Awards and Funding

- Collaborate@ICERM, January 2023. Proposal name: Point Configurations on Projective Varieties (with A. Caminata, N. Giansiracusa, H.-B. Moon).
- KTH travel fund, Academic Year 2021–2022, 20000 SEK.
- Research Support Fund, Massachusetts Society of Professors, Academic Year 2019–2020, \$1000.
- Research Support Fund, Massachusetts Society of Professors, Academic Year 2018–2019, \$1000.
- Marshall H. Stone Visiting Assistant Professor travel funding, \$2000 per academic year, 2017 – 2020.
- Dissertation Completion Award, University of Georgia, May 2016, funding for Fall 2016 – Spring 2017.
- William Armor Wills Memorial Scholarship Award, University of Georgia, Department of Mathematics, April 2016, \$1000.
- Outstanding Graduate Teaching Assistant Award, University of Georgia, April 2016.
- NSF Funding (PI: Valery Alexeev), University of Georgia, Fall 2015, Summer 2016 and 2017.
- RTG Funding, University of Georgia, Spring 2016.
- Graduate School Research Assistantship, University of Georgia, Summer 2013, 2014, and 2015.
- Graduate Student Teaching Assistantship, University of Georgia, Fall 2012 – Spring 2015.

Invited Conference Talks

- MEGA 2022, Effective Methods in Algebraic Geometry, Pedagogical University of Cracow, Cracow, June 23, 2022.
- XMaths Workshop 2021, Università degli Studi di Bari Aldo Moro, Bari, December 21, 2021.
- Moduli spaces and logarithmic geometry, Institut Mittag-Leffler, Stockholm, November 19, 2021.
- Hodge Theory, Arithmetic and Moduli II, Texas A&M University, College Station, February 8, 2020.

- PIMS Symposium on Hodge Theory, Arithmetic and Moduli, University of British Columbia, Vancouver, May 15, 2019.
- BATMOBYLE, Amherst College, Amherst, May 2, 2019.
- Hodge Theory, Moduli and Representation Theory, Stony Brook University, August 17, 2017.
- Workshop on Algebraic Varieties, Hodge Theory and Motives, Fields Institute, Toronto, March 12, 2017.
- Focused Research Group on Hodge Theory, Moduli and Representation Theory: Workshop VIII, Washington University in St. Louis, St. Louis, January 8, 2017.
- Joint Mathematics Meetings, AMS Contributed Paper Session on Algebraic Geometry, Atlanta, January 6, 2017.
- American Institute of Mathematics, Workshop on Positivity of Cycles, San Jose, August 4, 2016.
- "Giornate di Geometria Algebrica ed Argomenti Correlati XIII", University of Catania, Catania, Italy, May 25, 2016.

Invited Seminar Talks

- University of Nottingham, Online Algebraic Geometry Seminar, July 28, 2022.
- Università di Pisa, Algebraic and Arithmetic Geometry Seminar, May 4, 2022.
- Tata Institute of Fundamental Research, Colloquium, online, January 22, 2021.
- University of California Riverside, UC Riverside Algebraic Geometry Seminar, online, January 19, 2021.
- University of California Riverside – Washington University in St. Louis, Mini-Seminar on Compactifications, online, October 1, 2020.
- University of Georgia, Algebraic Geometry Seminar, online, September 30, 2020.
- Rutgers University, Algebra Seminar, online, April 29, 2020.
- KTH Royal Institute of Technology, Fika webinar, online, April 23, 2020.
- Texas A&M University, Algebra and Combinatorics Seminar, College Station, February 7, 2020.
- Washington University in St. Louis, Algebraic Geometry Seminar, St. Louis, January 15, 2020.
- Pontificia Universidad Católica de Chile, Algebraic Geometry Seminar, Santiago, January 8, 2020.
- Duke University, Algebraic Geometry Seminar, Durham, August 30, 2019.
- Sapienza University of Rome, Algebra and Geometry Seminar, Rome, June 26, 2019.
- Washington University in St. Louis, Algebraic Geometry Seminar, St. Louis, February 27, 2019.
- University of Connecticut, Algebra Seminar, Storrs, November 14, 2018.
- Universitat de Barcelona, Barcelona Algebraic Geometry Seminar, Barcelona, June 8, 2018.
- Yale University, Yale Algebraic and Tropical Geometry Seminar, April 26, 2018.
- Northeastern University, Geometry, Physics, and Representation Theory Seminar, April 5, 2018.

- Stony Brook University, Algebraic Geometry Seminar, October 4, 2017.
- Colorado State University, FRAGMENT seminar, Fort Collins, May 4, 2017.
- Nagoya University, Algebraic Geometry Seminar, Nagoya, April 17, 2017.
- Kyoto University, Algebraic Geometry Seminar, Kyoto, April 14, 2017.
- Duke University, Algebraic Geometry Seminar, Durham, February 17, 2017.
- Leibniz Universität Hannover, Research Seminar Algebraic Geometry, Hannover, Germany, December 21, 2016.
- University of Utah, Algebraic Geometry Bootcamp, research group talk, Salt Lake City, July 2015.
- Roma Tre University, Algebraic Geometry Seminar, Rome, Italy, June 4, 2015.

Conference Poster Presentations

- "Riposte Armonie": Algebraic Geometry in Cetraro 2021 together with Ciro Ciliberto, September 22, 2021. Title: *Families of pointed toric varieties and degenerations.*
- AGNES, Stony Brook University, online, October 24, 2020. Title: *Compactifications of moduli of points and lines in the projective plane.*
- Ideals, Varieties, Applications: Celebrating the Influence of David Cox, Amherst College, June 11, 2019. Title: *A Pascal's theorem for rational normal curves.*
- AGNES, Brown University, September 22, 2018. Title: *Compactifications of moduli spaces of points and lines.*
- Birational Geometry and Moduli Spaces, INdAM, June 14, 2018. Title: *Compactifications of moduli spaces of points and lines.*
- AGNES, Northeastern University, October 14, 2017. Title: *K_3 surfaces with \mathbb{Z}_2^2 symplectic action.*
- AGNES, University of Massachusetts Amherst, November 5, 2016. Title: *The KSBA compactification of the moduli space of $D_{1,6}$ -polarized Enriques surfaces.*
- WAGS, Colorado State University, October 15, 2016. Title: *The KSBA compactification of the moduli space of $D_{1,6}$ -polarized Enriques surfaces.*
- AGNES, Brown University, October 3, 2015. Title: *On the cone of effective 2-cycles on $\overline{M}_{0,7}$.*

Talks at KTH Royal Institute of Technology

- KTH – Stockholm University, Kombinatorik Seminarium, online, March 10, 2021. Title: *Point configurations, phylogenetic trees, and dissimilarity vectors.*
- KTH – Stockholm University, Onsdag Zoom Seminarium, online, November 18, 2020. Title: *Compactifications of moduli of points and lines in the projective plane.*
- KTH Seminar in Algebraic Geometry and its Applications, August 31 and September 7, 2020. Title: *Mustafin varieties and moduli of points in the projective plane, I and II.*

Talks at the University of Massachusetts Amherst

- Reading Seminar in Algebraic Geometry, March 9, 2020. Title: *Homological mirror symmetry for elliptic curves. II.*
- Valley Geometry Seminar, January 31, 2020. Title: *A Pascal's theorem for rational normal curves.*
- Reading Seminar in Algebraic Geometry, October 4, 2019. Title: *Lattice theory, K_3 surfaces, and the Torelli theorem.*
- Discrete Math Seminar, September 12, 2019. Title: *Reconstructing degenerations of hyperplane arrangements.*
- Reading Seminar in Algebraic Geometry, February 22, 2019. Title: *Introduction to toric varieties.*
- Valley Geometry Seminar, February 15, 2019. Title: *Compactifications of the moduli space of K_3 surfaces with order 4 purely non-symplectic automorphism*
- Reading Seminar in Algebraic Geometry, October 19, 2018. Title: *The Mukai lattice of the Kuznetsov component.*
- Reading Seminar in Algebraic Geometry, February 16, 2018. Title: *The moduli space of 8 points on \mathbb{P}^1 and automorphic forms, following S. Kondo.*
- Valley Geometry Seminar, February 9, 2018. Title: *Equations for points to lie on a rational normal curve.*
- Reading Seminar in Algebraic Geometry, October 23, 2017. Title: *\mathbb{Q} -Gorenstein deformations of surface singularities.*
- Valley Geometry Seminar, October 20, 2017. Title: *Toward a compactification of the moduli space of Enriques surfaces by KSBA stable pairs.*

Talks for general audience

- The "What Is ...?" Graduate Seminar (TWIGS), University of Massachusetts Amherst, February 16, 2021. Title: *What is a secondary polytope?*
- Undergraduate Math Club Talk, University of Massachusetts Amherst, October 10, 2018. Title: *Precalculus of lines and conics in the projective plane.*
- Graduate Student Summer Conference, University of Georgia, July 26, 2017. Title: *Hyperbolic spaces and reflections.*
- Graduate Students Seminar, University of Georgia, September 20, 2016. Title: *The arithmetic of Enriques surfaces.*
- Mock AMS Conference, University of Georgia, July 27, 2016. Title: *Polyhedral subdivisions of the unit cube.*
- Graduate Students Seminar, University of Georgia, October 27, 2015. Title: *Fiber polytopes.*
- Mock AMS Conference, University of Georgia, July 29, 2015. Title: *The secondary polytope.*
- Mock AMS Conference, University of Georgia, July 31, 2013. Title: *Moduli spaces and the Hilbert scheme.*

Conferences/Workshops Attended

- MEGA 2022, Effective Methods in Algebraic Geometry, Pedagogical University of Cracow, Cracow, June 20–24, 2022.
- Algebraic Geometry in Roma Tre, on the occasion of Sandro Verra's 70th birthday, Roma Tre University, Rome, June 14–17, 2022.
- XMaths Workshop 2021, Università degli Studi di Bari Aldo Moro, Bari, December 21–22, 2021.
- Moduli spaces and logarithmic geometry, Institut Mittag-Leffler, Stockholm, November 15–19, 2021.
- Motives and Hodge theory, Institut Mittag-Leffler, Stockholm, October 18–22, 2021.
- "Riposte Armonie": Algebraic Geometry in Cetraro 2021 together with Ciro Ciliberto, Cetraro, September 21–24, 2021.
- Invited participant to the research program Moduli and Algebraic Cycles, Institut Mittag-Leffler, Stockholm, August 30–December 10, 2021.
- K_3 surfaces and hyperkähler manifolds, Università degli Studi di Milano, online, June 9, 2021.
- AGNES, Stony Brook University, online, October 23–25, 2020.
- Hodge Theory, Arithmetic and Moduli II, Texas A&M University, College Station, February 8–9, 2020.
- AGNES, Boston College, Chestnut Hill, September 20–22, 2019.
- Ideals, Varieties, Applications: Celebrating the Influence of David Cox, Amherst College, Amherst, June 10–14, 2019.
- PIMS Symposium on Hodge Theory, Arithmetic and Moduli, University of British Columbia, Vancouver, May 13–17, 2019.
- Recent Progress in Moduli Theory, MSRI, Berkeley, May 6–10, 2019.
- BATMOBYLE, Amherst College, Amherst, May 2, 2019.
- AGNES, University of Massachusetts Amherst, Amherst, March 22–24, 2019.
- AGNES, Brown University, Providence, September 21–23, 2018.
- Combinatorial Algebraic Geometry Retrospective Workshop, Fields Institute, Toronto, June 18–22, 2018.
- Birational Geometry and Moduli Spaces, INdAM, Rome, June 11–15, 2018.
- AGNES, Rutgers University, New Brunswick, April 13–15, 2018.
- Georgia Algebraic Geometry Symposium, Georgia Institute of Technology, Atlanta, February 23–25, 2018.
- AGNES, Northeastern University, Boston, October 13–15, 2017.
- Conference on Birational Geometry, Simons Foundation, New York, August 21–25, 2017.
- Hodge Theory, Moduli and Representation Theory, Stony Brook University, August 14–18, 2017.
- Workshop on Algebraic Varieties, Hodge Theory and Motives, Fields Institute, Toronto, March 9–12, 2017.

- Georgia Algebraic Geometry Symposium, University of Georgia, Athens, March 3–5, 2017.
- Joint Mathematics Meetings, Atlanta, January 4–7, 2017.
- Thematic Program on Combinatorial Algebraic Geometry, Workshop on Combinatorial Moduli Spaces and Intersection Theory, Fields Institute, Toronto, December 5–9, 2016.
- AGNES, University of Massachusetts Amherst, Amherst, November 4–6, 2016.
- WAGS, Colorado State University, Fort Collins, October 15–16, 2016.
- Georgia Summer Workshop in Algebraic Geometry, University of Georgia, Athens, August 27–28, 2016.
- Positivity of Cycles, American Institute of Mathematics, San Jose, California, August 1–5, 2016.
- Thematic Program on Combinatorial Algebraic Geometry, Graduate Summer School on Combinatorial Algebraic Geometry, Fields Institute, Toronto, July 18–22, 2016.
- "Giornate di Geometria Algebrica ed Argomenti Correlati XIII", University of Catania, Italy, May 25–28, 2016.
- Spring Southeastern Sectional Meeting, University of Georgia, Athens, March 5–6, 2016.
- Georgia Algebraic Geometry Symposium, Emory University, Atlanta, October 23–25, 2015.
- AGNES, Brown University, Providence, October 2–4, 2015.
- Summer Research Institute on Algebraic Geometry, University of Utah, Salt Lake City, July 13–24, 2015.
- The Graduate Students Bootcamp for the 2015 Algebraic Geometry Summer Research Institute, University of Utah, Salt Lake City, July 6–10, 2015.
- Georgia Algebraic Geometry Symposium, University of Georgia, Athens, October 17–19, 2014.
- Graduate Workshop on Moduli of Curves, Simons Center, Stony Brook University, July 7–18, 2014.
- Georgia Algebraic Geometry Symposium, University of Georgia, Athens, October 18–20, 2013.
- Advanced Course "Compactifying Moduli Spaces", Centre de Recerca Matemàtica, Barcelona, May 27–31, 2013.

Mentoring Experience

- Mentoring Lukas Gustafsson (Sandra Di Rocco's PhD student) on topics in pure algebraic geometry. KTH, Fall 2020.
- Research Experiences for Undergraduates (REU), University of Massachusetts Amherst, Summer 2018. Student: Patrick Lei.
 - For the background we covered Miles Reid's "*Undergraduate algebraic geometry*".
 - The research project was related to the paper: arXiv:1711.06286

Outreach

- UGA High School Math Tournament, 2016.
 - The day of the tournament I helped with registration, proctoring, and grading.
 - I designed the picture on the tournament T-shirt.
 - I drew most of the pictures for the tournament problems.
 - I helped with writing test problems and solutions.
- UGA High School Math Tournament, 2015. I helped with writing test problems and solutions.

Organizational Experience

- Co-organizer of the conference Algebraic Geometry in Roma Tre, on the occasion of Sandro Verra's 70th birthday, Roma Tre University, June 2022.
- Co-organizer of the Geometry Seminar at Roma Tre University (March 2022 – present).
- I organized the poster session for the conference AGNES at the University of Massachusetts Amherst, March 2019.

Service

- KTH Royal Institute of Technology
 - I helped with the social online-meeting with the interviewed candidates for the associate professor position in mathematics with focus in algebraic geometry, November 8–9.
- University of Massachusetts Amherst
 - Jacob-Cohen-Killam competition, University of Massachusetts Amherst, February 2020. I helped with creating some of the problems, writing the solutions, proctoring, and grading.
 - Panelist, "Panel discussion: how to apply for academic jobs in math", September 2019.
 - Jacob-Cohen-Killam competition, University of Massachusetts Amherst, March 2019. I helped with creating some of the problems and with grading.
- University of Georgia
 - I helped with hospitality at local conferences: Georgia Algebraic Geometry Symposium (2017), Georgia Summer Workshop in Algebraic Geometry (2016), and Topological Approaches to Algebra and Arithmetic Geometry (2016).
 - I served as panelist in several occasions: professional development for early career graduate students, Graduate Visitation Day for prospective students.

Referral and Reviewing

- Referee for AMS Book Program, Proceedings of the International Symposium on Symbolic and Algebraic Computation (ISSAC), *Mathematische Zeitschrift*, Springer Conference Proceedings, and *Advances in Mathematics*.
- Reviewer for *AMS Mathematical Reviews* (2019 – present). Papers reviewed: MR3904797, MR3934628, MR4001812, MR4010872, MR4047698, MR4132605.

Programming Languages/Mathematics Software

C, Python/Mathematica, LRS, Macaulay2, SageMath

Languages

- Italian (native language)
- English (fluent, written and spoken)
- Swedish (A1 level)

Place and date:

Rome, 23/09/2022